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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/856,342	08/22/2001	Hermann Bruggendick	AZ.2673	6856

30996 7590 08/16/2006

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SUITE B  
TIJERAS, NM 87059-7507

EXAMINER
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COCKS, JOSIAH C

ART UNIT	PAPER NUMBER
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3749

DATE MAILED: 08/16/2006

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 09/856,342  
Filing Date: August 22, 2001  
Appellant(s): BRUGGENDICK ET AL.

**MAILED**  
**AUG 16 2006**  
**Group 3700**

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Robert W. Becker  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed June 26, 2006 appealing from the Office action mailed February 3, 2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

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**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

4,790,743	LEIKERT ET AL.	12-1988
4,739,713	VIER ET AL.	4-1988
5,411,394	BEER ET AL.	5-1995
5,809,910	SVENDSSEN	9-1998

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

**Claims 7, 9, 11, 12, and 19** are rejected under **35 U.S.C. 102(b)** as being anticipated by U.S. Patent No. 4,790,743 to Leikert et al. ("Leikert")

Leikert discloses in Figures 1-3 a method of burning nitrogen containing fuel while reducing the emission of nitrogen oxides as described by applicant's claims 7, 9, 11, 12, and 19. In particular, Leikert shows producing a fuel-rich (i.e. sub-stoichiometric) primary flame core (zones 7 and 8) from all of the fuel supplied to core and primary air and adding a nitrogen oxide reducing agent (via nozzles 4) wherein the agent may consist of coal dust (i.e. a hydrocarbon fuel and thus a hydrocarbon as claimed) (see col. 2, lines 44-56). Leikert further discloses that the flame core is enveloped with a veil of secondary air (see col. 3, lines 44-60) and the nitrogen

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reducing agent is introduced together with both primary/core air and with fuel (see col. 3, lines 14-35).

In regard to the limitation that the reducing agent is distributed within the flame core, the examiner considers this limitation met by Leikert. The examiner considers that flame zones (7 and 8) of Leikert taken together are properly considered the flame core recited in applicant's claims. Leikert describes the secondary zone (8) as being "in the vicinity and around the primary flame zone" (see col. 3, lines 34-35). As shown in Fig. 1, the reducing agent supplied via nozzles (4) is clearly distributed within the flame core formed from flame zones (7 and 8). The reduction fuel is described as being uniformly distributed over the cross-section of the combustion chamber (see col. 3, lines 55-60)

**Alternatively, claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,790,743 to Leikert et al. ("Leikert") in view of U.S. Patent No. 4,739,713 to Vier et al. ("Vier").**

Leikert discloses in Figures 1-3 a method of burning nitrogen containing fuel while reducing the emission of nitrogen oxides substantially as described by applicant's claims 7 and 17. In particular, Leikert shows producing a fuel-rich (i.e. sub-stoichiometric) primary flame core from all of the fuel supplied to core and primary air and adding a nitrogen oxide reducing agent wherein the agent may consist of coal dust (see col. 2, lines 44-56). Leikert further discloses that the flame core is enveloped with a veil of secondary air (see col. 3, lines 44-60) and the nitrogen reducing agent is introduced together with both primary/core air and with fuel (see col. 3, lines 14-35).

In regard to the limitation that the reducing agent is nitrogen, the examiner notes that the title of the Leikert patent is “Method of reducing the NO<sub>x</sub>-emissions during combustion of *nitrogen-containing fuels*” (emphasis added). The fuel that is being utilized in Leikert is coal dust thus implying that coal dust contains nitrogen and thus the coal dust supplied as a nitrogen oxide reducing agent would qualify as a nitrogen compound as claimed. In further support of this observation, the Vier reference is cited. Vier teaches a coal-dust fired combustion system in the same field of endeavor as Leikert, wherein Vier specifically discloses the coal dust is known in the art to include nitrogen which is termed “in-fuel” nitrogen (see Vier col. 1, lines 41-45). A person of ordinary skill in the art would therefore recognize that the coal dust of Leikert, which is acknowledged to function as a nitrogen oxide reducing agent (see col. 2, lines 44-53), would include nitrogen and is, therefore, a nitrogen compound as claimed.

Further, in regard to the limitation that the nitrogen compound is natural gas or methane, Leikert discloses that the reduction agent may be a “burnable gas” (see col. 2, lines 54-55). The examiner considers that a person of ordinary skill in the art would reasonably consider the selection of a well-known combustible gas such as natural gas or methane as the “burnable gas” to function as the reduction fuel. Alternatively, reference is also made to Vier to support this assertion. In Vier, natural gas is identified as the reducing agent (see Vier, col. 3, lines 37-38). It would have been obvious to a person of ordinary skill in the art at the time the invention as made that the burnable gas of Leikert would be natural gas as identified in Vier as natural gas is well known to desirably serve as a reducing gas in the combustion art.

While appellant has indicated that claims 7-9, 11, 12, and 16-19 are appealed (see section III of appellant's Brief), the only grounds of rejection that appellant has requested to be reviewed on appeal are those of claim 7 (see section VI of appellant's Brief). Accordingly, only the applicable rejections that address claim 7 have been reproduced above. However, reference is made to the Final Office action mailed February 3, 2006 for statements of the grounds of rejection of the claims incorporating the references to Beer et al. and Svendsen.

#### **(10) Response to Argument**

##### Regarding the rejection of claim 7 under 35 USC 102(b) over Leikert

Appellant argues that the flame zones (7 and 8) of Leikert are not properly considered to be the flame core recited as recited. Appellant further argues that the only the flame zone (7) should be regarded as the flame core in Leikert.

In response, the examiner notes that it is well settled that during patent examination claims are to be given their broadest reasonable interpretation consistent with the underlying specification without reading limitations from the specification into the claims. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969). With this in mind, the examiner maintains the position that, in giving the term "flame core" its broadest reasonable interpretation, the limitation reads on the arrangement of the flame zones (7 and 8) in Leikert. The examiner notes that as shown particularly in Fig. 1 of Leikert these flame zones (7 and 8) form an interior flame, which is surrounded by the outer flame zone (9). Neither appellant's specification nor the teachings of the prior art prohibit a "flame core" from having multiple zones.

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Further, appellant appears to further argue that a flame core must have a uniform air to fuel ratio and that the flame zones (7 and 8) of Leikert having different air to fuel ratios (such as shown in Fig. 1 of Leikert) renders these zones “separate and different” such that they cannot be regarded as a flame core (see appellant’s Brief, p. 6). There is no support in appellant’s specification, nor would be commonly understood, for such a definition of flame core.

Furthermore, the examiner notes that Leikert clearly describes that the range of the air to fuel ratio of the primary flame zone (7) may be anywhere between 0.65 to 0.9 (Leikert, col. 2, lines 61-62) and that the range of the air to fuel ratios of the secondary flame zone (8) may be between 0.5 to 0.8 (Leikert, col. 2, line 63). Therefore, even if *arguendo* one were to assume that the “flame core” recited in applicant’s claims required a uniform air to fuel ratio, this definition would also be met by the flame zones (7 and 8) of Leikert as the air to fuel ratios contemplated for these flame zones include overlapping ranges (i.e. a ratio of 0.65 to 0.8). This disclosure in Leikert clearly contradicts appellant’s assertion that the flame zones (7 and 8) of Leikert must be demarcated such that they are “separate and different” (see Brief, p. 6, middle paragraphs). It is not clear how appellant can make the assertion that these zones must be “separate and different” (and thus not a flame core) when Leikert clearly discloses that these two zones (7 and 8) may have identical air to fuel ratios (again see Leikert, col. 2, lines 60-64).

The examiner notes that appellant’s arguments appear to suggest that the examiner is modifying Leikert to distribute the reducing agent within flame zone (7) (see Brief, pp. 6-8). However, the examiner has made no such modification. As noted above, the examiner considers that as appellant’s claimed “flame core” is met by the two zones (7 and 8) disclosed by Leikert.



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The distribution of the reducing agent within flame zone (8) described by Leikert is properly regarded as supplying the reducing agent to the flame core as claimed in appellant's claim 7.

Regarding the rejection of claim 7 under 35 USC 103(a) based on Leikert in view of Vier

Claim 7 was also rejected under 35 USC 103(a) on the basis of Leikert in view of Vier. This alternative rejection was applied to reject the alternative statement in claim 7 that the nitrogen reducing agent is a nitrogen compound (instead of a hydrocarbon). This rejection was applied to later dependent claims (e.g. claims 16 and 17), which narrowed the reducing agent to be a nitrogen compound, and is also applicable to claim 7. As noted above, Vier is cited primarily to show that the coal dust disclosed in Leikert would be understood in the art to include "in-fuel" nitrogen and is thus may be considered a nitrogen compound as claimed.

Further, Vier also supports examiner's assertion that flame zones (7 and 8) of Leikert may properly be considered the "flame core" recited in applicant's claims, the examiner points to the use of the term "core" as appearing in Vier. Vier identifies in multiple locations a burner core (55). This burner core is considered analogous to applicant's recited flame core. Vier specifically notes that such a burner core has multiple "zones" (e.g. see col. 2, lines 9-10, and col. 5, lines 2, 11, and 67). Accordingly, the examiner considers that a person of ordinary skill in the art would recognize that the use of the term "core" in the art includes multiple "zones" (such as 7 and 8 of Leikert) as the definition of such terminology is recognized in the art as evidenced by Vier.

Appellant further argues that the teachings of Vier would not prompt a person of ordinary skill in the art to cause a reducing agent to be introduced into the primary flame zone (7) of

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Leikert. However, Vier has not relied upon by the examiner for such a showing. As noted above, Vier is relied upon to show that a person of ordinary skill in the art would recognize that the coal dust used as the reducing agent in Leikert would include nitrogen and as evidence that a natural gas would be a type of burnable gas identified in Leikert.

As was the case in appellant's arguments regarding Leikert taken alone, appellant has argued that the examiner is proposing modifying Leikert to supply a reducing agent to flame zone (7). However, the examiner again notes that this not an accurate characterization of the examiner's position. As thoroughly articulated previously, and again above, applicant's flame core is not distinguished from flame zones (7 and 8) of Leikert. Therefore, applicant's claims are fully met by the disclosure of adding reduction fuel from nozzles (4) to the flame core via flame zone (8).

Regarding appellant's claims 8-9, 11, 12, and 16-19

Appellant has not separately argued the grounds of rejection that have been applied to these dependent claims. These claims have only been asserted to be patentable based on their dependency on claim 7. As claim 7 is not considered patentable for the reasons noted above, these dependent claims are likewise not considered patentable. However, reference is made to the rejections of these claims reproduced above that were rejected in conjunction with claim 7 on the basis of Leikert and alternatively Leikert in view of Vier. Reference is also made to the remaining rejections of the claims based on the references to Beer et al. and Svendsen that are not reproduced above, but are included in the Office action mailed February 2, 2006.

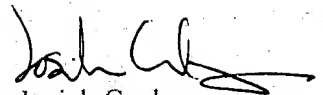
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**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

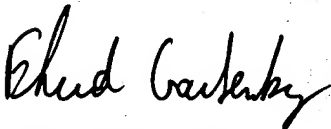
For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

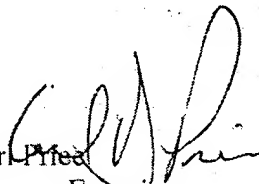


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